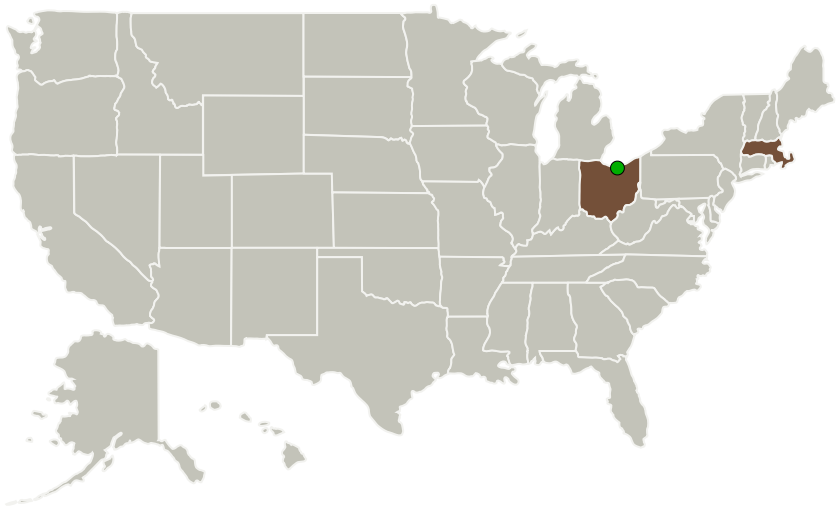
Efficient, Long-Lived Radioisotope Power Generator, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Radiation Monitoring Devices, Inc., (RMD) proposes to develop an alternative very long term, radioisotope power source with thermoelectric power conversion with greater than 10% energy efficiency for deep space applications. The proposed technology is based on a betavoltaic generator which can be produced in bulk form, allowing the construction of generators with power output similar to radioisotope thermal generators (RTG) but with higher efficiency. In Phase I, RMD will estimate the potential performance of the betavoltaic generator, examine practical issues affecting manufacturability and lifetime, and experimentally demonstrate components of the proposed betavoltaics generator. The Phase I results will provide clear "Go-No Go" results. The goal of Phase II is to complete the research and development on the betavoltaic generator technology, and to build and test a small prototype system with at least 10% conversion efficiency. A major focus of Phase II will be the development of the crystal growth process including dispersing radioactive sources within the scintillator. By the end of Phase II, the generator technology will have been demonstrated and ready for further engineering to bring it to a more advanced level (TRL-6) in 2 to 3 years.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Radiation Monitoring Devices, Inc.	Lead Organization	Industry	Watertown, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138117)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Radiation Monitoring Devices, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

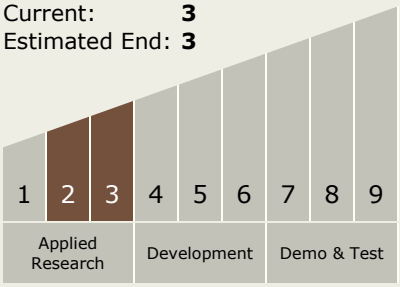
Carlos Torrez

Principal Investigator:

Noa M Rensing

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.3 Static Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System